**Teacher’s Guide to Avian Adaptations Lab**

**Purpose:**

The purpose of this laboratory exercise is to get the students thinking about the world around them in terms of adaptations and development of various traits. The students will use the structural qualities of different bird specimens to determine the behaviors of the birds and the environmental conditions the birds live under. The exercise is formulated so the student is going to be making a museum exhibit using various bird specimens. This should help students become more comfortable with the idea of categorizing organism by their structural features. Hopefully students will be able to apply these concepts to their everyday encounters with organisms.

**Concepts/Objectives:**

The concepts being exhibited in this laboratory exercise are mostly rooted in population ecology. Ideas such as niches, adaptations, and the effect of prey and movement on physical structures were seen throughout the activity. Upon completing this lab, the student will be able to predict the environmental conditions that would cause a particular physical adaptation to arise within a certain species of bird. The student should take what is learned in the lesson about adaptive bird behaviors and apply it to the adaptations of other organisms.

**Standards:**

State Goal #11 Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

11.A.4a: Formulate hypotheses referencing prior research and knowledge.

Descriptor Stage I – 11A-1: Formulate independent content-specific hypothesis referencing pertinent reliable prior research, or proposing options for appropriate questions, procedural steps, and necessary resources.

State Goal #12 Understand the fundamental concepts, principles, and interconnections of life.

12.B.4a: Compare physical, ecological, and behavior factors that influence interactions and interdependence of organisms.

Descriptor Stage I – 12B-1: Identifying the roles and relationships of organisms in their community in terms of impact on populations and the ecosystem.

**Materials Needed:**

There are not many materials that are required for this lab exercise. The main thing that you need for this lab is the stuffed bird specimens. You could use worksheets with tables so the students can record their observations. If you wanted to take this activity further and allowed the students to actually make their own exhibit. They would need subsequent materials if you wanted to have them just draw it or actually make a diorama type exhibit.

**Preparation Guide:**

The only part of this activity that truly requires preparation and maintenance are the actual bird specimens. The specimens are very fragile and require a great deal of care when setting them up and preserving them. Before teaching the lesson, the students need to know that they must be gentle with the samples or else they will be broken.

**Individual Set Up:**

The only individual set up that is required is the background information about understanding the physical structures of organisms and how you can use them to understand different developmental patterns in organisms.

**Time/Length of Lab:**

The time and length of the lab depends on the detail that you would like to go into with the discussion and whether or not you are willing to have the students go outside within the same lab period for their “Outdoor Exploration” activity. This could also be assigned as homework if there is not enough time in the period. If the students were to go outside the lab in the fashion that I have organized it would probably take more than a 50 minute class period. Without going outside the lab should take about 50 minutes.

**Safety Issues:**

Being that this laboratory activity is based on mostly observation there are not many physical actions that would present safety issues for students there are not many safety issues worth noting. However, sometimes the specimens are preserved with arsenic, it would be a good idea to not let the students touch the samples with their hands.

**Pre-lab Discussion Guide:**

The key to the discussion before this lab is to give the students the background they need in order to come up with the concepts they need to complete the classifications. A quick review of the recent relevant material should suffice for the pre-discussion. If you would like you could answer any questions the students may have about the material.

**Post-lab Discussion Guide:**

This discussion is more important than the pre-discussion. Determine what the students predicted as far as behaviors and environments of the birds. Just go through each of the specimens and talk about the adaptations that they found and why they thought them. Here you must correct any misconceptions that students came up with. Make sure that the students understand that they can learn a great deal of information about an organism if they just look at the physical structure. If you would like, you could have the students explain their exhibits and their rationales to you. You can follow up the activity with various ways to incorporate the thought of adaptations in organisms to live in an environment. Such as having the students use the behaviors they came up with in the previous activity and apply them to other organisms and have them try and find out the structures they have adapted to live under similar conditions. Also, you could have the students go outside and observe various organisms and decipher the structures that can be seen and how they were potentially developed.

**Adaptations for Special Needs:**

You could present students that have vision deficiencies models that are more colorful and have obvious definitions. Also you could play them the sounds of the birds so that they can get some sense of the specimens that you are dealing with. Perhaps a student with behavior problems would be able to be partnered with a student to help keep them focused on helping make the exhibit.

**Lab Diagram:**

This class could be easily adapted for a class of 28 students. I would most likely use specimens that would be a little more durable such as false stuffed animals. Also, it would be a good idea to have a way of watching over all of the students to make sure that your specimens don’t grow legs and run off. If you have a large class I would make sure that each student has a specific station to be at during a specific period of time, then you don’t have to worry about them becoming distracted by their peers as much as they would. The “Outdoor Exploration”, would be a great activity for a large class. It would show them the organisms that live in the world around us and they would be able to pick up on the vast diversity of life.